



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/560,360	11/16/2006	Hiroyuki Ochiai	28323-4US2X PCT	9014
22850	7590	08/18/2011		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
VERDIER, CHRISTOPHER M				
ART UNIT		PAPER NUMBER		
3745				
NOTIFICATION DATE		DELIVERY MODE		
08/18/2011		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com

oblonpat@oblon.com

jgardner@oblon.com

Office Action Summary**Application No.**

10/560,360

Applicant(s)

OCHIAI ET AL.

Examiner

Christopher Verdier

Art Unit

3745

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 26-28 and 30-32 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 26-28 and 30-32 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☒ The drawing(s) filed on 21 October 2010 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-SB-005)
Paper No(s)/Mail Date ____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on June 6, 2011 has been entered.

Applicant's Amendment dated June 6, 2011 has been carefully considered but is non-persuasive. With regard to the rejection of claim 32 under 35 USC 112, first paragraph, as failing to comply with the written description requirement, Applicant has argued that electrode 49 may be formed, as described in the non-limiting example on page 11, lines 15-18, from a solid body of Si and Si powder, and that the term "consisting essentially of" provides the accurate description of an electrode of solid Si and Si powder where there may be some impurities or other non-Si element in the electrode. Applicant has further argued that the "meaning of the phrase "consisting essentially of" is judicially well-established to define a claim scope as limited to the recited material "and those [materials] that do not materially affect the basic and novel characteristic(s)" of the claimed invention. See MPEP §2111.03 and *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461,463 (CCPA 1976). Moreover, in the original disclosure lines 15-16 on page 11, for example, state "the electrode 49 is composed of a molded body molded by compressing a solid body of Si and powder of Si by means of pressing ...". One skilled in the art would construe this description as preparing a body consisting essentially of Si and that the molding or pressing process unavoidably causes incorporation of some impurities into the electrode. Such impurities do not materially affect the novel characteristics of the electrode. Thus, the disclosure adequately supports the language of claim 32 since it provides adequate support for an electrode "consists essentially of Si" and possibly includes "minor elements that

Art Unit: 3745

are not actually disclosed" that do not materially affect the basic and novel characteristics of the electrode."

These arguments are respectfully disagreed with, because the language that the tool electrode consists essentially of Si has no support in the original disclosure for this added limitation, and "consists essentially" adds new matter, because it would include minor elements that are not actually disclosed. With regard to Applicant's argument that one skilled in the art would construe this description as preparing a body consisting essentially of Si and that the molding or pressing process unavoidably causes incorporation of some impurities into the electrode, and that such impurities do not materially affect the novel characteristics of the electrode, review of the specification reveals that there is no mention of the body consisting essentially of Si, and there is no mention of impurities.

Applicant's argument that SiC is a compound of Si and C, and that this should not be construed to include Si as recited in claim 26, is not persuasive. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Applicant has the opportunity to amend claim 26 to recite that the tool electrode consists of Si.

Applicant's arguments that Goto 6,492,611 does not teach use of Si as an electrode to form a coating including SiC, but that in Goto, formation of a coating including SiC requires use of an electrode including SiC, and that claim 26 cannot be derived from Goto, are not persuasive. Applicant's argument that to form a coating including SiC from an electrode of Si, chemical reaction of Si departing from the electrode with alkane hydrocarbons is used as recited in claim 26, but that none of the references suggest such a reaction, is not persuasive. Column

Art Unit: 3745

4, line 23 of Goto clearly states that the electrode 3 may be SiC. SiC is coated on a portion of an untreated component W by processing a portion as a workpiece of an electric spark machine with a tool electrode 3 of SiC (which includes Si) in a liquid including alkane hydrocarbons (oil containing hydrocarbons (column 4, lines 26-36). Using the electrode of SiC still results in the claimed coating including SiC, due to the interaction in the liquid including alkane hydrocarbons (oil containing hydrocarbons).

Applicant's arguments that Magara teaches use of copper, graphite and the like as an electrode, that while Magara teaches use of silicon particles, these particles are mixed with a solution and are not used as an electrode, that Magara fails to teach formation of a coating including SiC, that the discussion at column 6, lines 55-57 only refers to forming a silicon cover film and column 7, lines 15-17 does not mention forming a SiC coating using an Si electrode, are not persuasive. Applicant's argument that to form a coating including SiC from an electrode of Si, chemical reaction of Si departing from the electrode with alkane hydrocarbons is used as recited in claim 26, but that none of the references suggest such a reaction, is not persuasive. Magara discloses a tool electrode 4 of Si (column 6, lines 55-57 and column 7, lines 15-17). A coating including SiC coated on a portion of an untreated component 5 is formed by processing a portion as a workpiece of an electric spark machine with a tool electrode 4 of Si in a liquid 8 including alkane hydrocarbons (mineral oil, kerosene, or silicon oil).

Applicant has argued that "based on these teachings, one skilled in the art could not have a reasonable expectation of success in formation of a coating including SiC from an electrode of Si. When there was no expectation of success, a conclusion of unobviousness is improper. In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976)Amgen, Inc. v. Chugai Pharmaceutical Co., 927 F.2d 1200, 1207-08, 18 USPQ2d 1016, 1022-23 (Fed. Cir.), cert. denied,

Art Unit: 3745

502 U.S. 856 (1991).” These arguments are not persuasive, because the primary reference to Goto discloses forming the SiC coating for the reasons presented above. Since Goto inherently includes formation of the SiC coating, and Goto is not modified to produce the SiC coating, there is no requirement for a reasonable expectation of success, since Goto already discloses production of the SiC coating. Similarly, the primary reference to Magara discloses a Si electrode, for the reasons presented above. Since Magara inherently includes formation of the SiC coating, and Magara is not modified to produce the SiC coating, there is no requirement for a reasonable expectation of success, since Magara already discloses production of the SiC coating.

The examiner notes that claim 75 has been canceled in copending application 10/560,173, overcoming the provisional obviousness-type double patenting rejections in the instant application.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 32 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. New claim 32 recites that the tool electrode consists essentially of Si. There is no support in the original disclosure for this added limitation, and “consists essentially” adds new matter, because it would include minor elements that are not actually disclosed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 26 and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goto 6,492,611 in view of Japanese Patent 5-148,615. Goto discloses a method for surface treatment on a component substantially as claimed, comprising: forming a coating including SiC coated on a portion W by processing the portion as a workpiece of an electric spark machine with a tool electrode 3 of SiC (which includes Si) in a liquid including alkane hydrocarbons (oil containing hydrocarbons). The tool electrode is formed from powder of Si, and the tool electrode is formed by compression. Note column 4, lines 14-25, for example. Alternatively, concerning claim 30, which recites that the tool electrode is formed from Si powder, and claim 31, which recites that tool electrode is formed by a method selected from the group consisting of compression, slurry pouring, metal injection molding and spray forming, these are product-by-

Art Unit: 3745

process limitations. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product-by-process claim does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

However, Goto does not disclose that the surface treatment is on a portion of a component of a turbine engine.

Japanese Patent 5-148,615 (paragraph 16) teaches that it is known to use electric spark machine coating to coat a turbine blade, for the purpose of providing a coating application method.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to apply the process of coating of Goto to a turbine blade, as taught by Japanese Patent 5-148,615, for the purpose of providing a coating application method.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goto 6,492,611 and Japanese Patent 5-148,615 as applied to claim 26 above, and further in view of Burns 6,042,898. The modified arrangement of Goto shows a method substantially as claimed as set forth above, but do not show processing the coating with a peening treatment.

Burns (column 1, lines 11-27) shows a gas turbine engine component having an oxidation resistant coating which is then peened, which introduces residual compressive stress, for the purpose of enhancing the material properties of the gas turbine engine component.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to process the coating of modified arrangement of Goto with a peening treatment, as taught by Burns, for the purpose of providing enhanced material properties.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goto 6,492,611 and Japanese Patent 5-148,615 as applied to claim 26 above, and further in view of WIPO Publication WO 00/53896. The modified arrangement of Goto shows all of the claimed subject including tool electrodes that move to approach portions of a workpiece, but does not show that the portion is limited to a leading edge, a suction sidewall, a pressure sidewall, a tip end face, and a flow pathway of the component.

WIPO Publication WO 00/53896 (figures 1-2; US 6,769,866 is the English equivalent) shows an airfoil 1 of a rotor a turbine engine, comprising: a main body including a convex suction sidewall faced to a suction side, a concave pressure sidewall opposed to the suction sidewall, a leading edge 12, a trailing edge 10 opposed to the leading edge, a tip end face at an axially outer end of the main body, and an unnumbered platform at an axially inner end of the main body, the platform including a flow pathway and a dovetail; a protective coating coated on the leading edge, the suction sidewall, the pressure sidewall, the tip end face, and the flow pathway, the protective coating including SiC, for the purpose of providing oxidation resistance.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the coating on the modified turbine blade to a leading edge, a suction sidewall, a pressure sidewall, a tip end face, and a flow pathway of the component, as taught by WIPO Publication WO 00/53896, for the purpose of providing oxidation resistance. The recitation of the coated portion being limited to a leading edge, a suction sidewall, a pressure sidewall, a tip end face, and a flow pathway of the component is a matter of choice in design. It would have been obvious to a designer having ordinary skill in the art to limit the coating to specific portions of the turbine blade that are desired to be protected, in order to provide oxidation protection.

Claims 26 and 30-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Magara in view of Japanese Patent 5-148,615. Magara discloses a method for surface treatment on a component substantially as claimed, comprising: forming a coating including SiC coated on a portion of a component 5 by processing the portion as a workpiece of an electric spark machine with a tool electrode 4 of Si in a liquid 8 including alkane hydrocarbons (mineral oil, kerosene, or silicon oil). Concerning claim 30, which recites that the tool electrode is formed from Si powder, and claim 31, which recites that tool electrode is formed by a method selected from the group consisting of compression, slurry pouring, metal injection molding and spray forming, these are product-by-process limitations. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product-by-process claim does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). The tool electrode consists essentially of Si.

However, Magara does not disclose that the surface treatment is on a portion of a component of a turbine engine.

Japanese Patent 5-148,615 (paragraph 16) teaches that it is known to use electric spark machine coating to coat a turbine blade, for the purpose of providing a coating application method.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to apply the process of coating of Magara to a turbine blade, as taught by Japanese Patent 5-148,615, for the purpose of providing a coating application method.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Magara 5,434,380 and Japanese Patent 5-148,615 as applied to claim 26 above, and further in view of Burns 6,042,898. The modified arrangement of Magara shows a method substantially as claimed as set forth above, but do not show processing the coating with a peening treatment.

Burns (column 1, lines 11-27) shows a gas turbine engine component having an oxidation resistant coating which is then peened, which introduces residual compressive stress, for the purpose of enhancing the material properties of the gas turbine engine component.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to process the coating of the modified arrangement of Magara with a peening treatment, as taught by Burns, for the purpose of providing enhanced material properties.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Magara 5,434,380 and Japanese Patent 5-148,615 as applied to claim 26 above, and further in view of WIPO Publication WO 00/53896. The modified arrangement of Magara shows all of the claimed subject including tool electrodes that move to approach portions of a workpiece, but does not show that the portion is limited to a leading edge, a suction sidewall, a pressure sidewall, a tip end face, and a flow pathway of the component.

WIPO Publication WO 00/53896 (figures 1-2; US 6,769,866 is the English equivalent) shows an airfoil 1 of a rotor a turbine engine, comprising: a main body including a convex suction sidewall faced to a suction side, a concave pressure sidewall opposed to the suction sidewall, a leading edge 12, a trailing edge 10 opposed to the leading edge, a tip end face at an axially outer end of the main body, and an unnumbered platform at an axially inner end of the main body, the platform including a flow pathway and a dovetail; a protective coating coated on the leading edge, the suction sidewall, the pressure sidewall, the tip end face, and the flow pathway, the protective coating including SiC, for the purpose of providing oxidation resistance.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the coating on the modified turbine blade to a leading edge, a suction sidewall, a pressure sidewall, a tip end face, and a flow pathway of the component, as taught by WIPO Publication WO 00/53896, for the purpose of providing oxidation resistance. The recitation of the coated portion being limited to a leading edge, a suction sidewall, a pressure sidewall, a tip end face, and a flow pathway of the component is a matter of choice in design. It would have been obvious to a designer having ordinary skill in the art to limit

the coating to specific portions of the turbine blade that are desired to be protected, in order to provide oxidation protection.

Claims 30-31 are also rejected under 35 U.S.C. 103(a) as being unpatentable over Magara and Japanese Patent 5-148,615 as applied to claim 26 above, and further in view of Goto 6,492,611. The modified device of Magara shows a method for surface treatment on a component substantially as claimed, comprising: forming a coating including SiC coated on a portion of a component 5 by processing the portion as a workpiece of an electric spark machine with a tool electrode 4 of Si in a liquid 8 including alkane hydrocarbons (mineral oil, kerosene, or silicon oil).

However, the modified device of Magara does not explicitly show that the tool electrode is formed from Si powder (claim 30), and does not explicitly show that the tool electrode is formed by a method selected from the group consisting of compression, slurry pouring, metal injection molding and spray forming (claim 31).

Goto shows a method for surface treatment on a component, comprising forming a coating including SiC coated on a portion W by processing the portion as a workpiece of an electric spark machine with a tool electrode 3 of SiC (which includes Si) in a liquid including alkane hydrocarbons (oil containing hydrocarbons). The tool electrode is formed from powder of Si, and the tool electrode is formed by compression, for the purpose of forming an electrode which is allowed to react with the alkane hydrocarbons (oil containing hydrocarbons). Note column 4, lines 14-25, for example.

It would have been further obvious at the time the invention was made to a person having ordinary skill in the art to form the modified device of Magara such that the tool electrode is formed from Si powder, and such that the tool electrode is formed by a method comprising compression, as taught by Goto, for the purpose of forming an electrode which is allowed to react with the alkane hydrocarbons.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Verdier whose telephone number is (571)272-4824. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward K. Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Verdier/
Primary Examiner, Art Unit 3745

Christopher Verdier
Primary Examiner
Art Unit 3745